

REMARKS

Claims 1 – 16 are pending and under consideration.

In the Office Action, Claims 1 – 16 were rejected.

In this Amendment, Claims 1, 2, 7 and 12 are amended. No new matter has been introduced as a result of this amendment.

Accordingly, Claims 1 – 16 remain at issue.

I. 35 U.S.C. § 103 Obviousness Rejection of Claims

Claims 1-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishijima et al. (U.S. Patent No. 6,263,151) in view of Ozue et al. (“Ozue”) (U.S. patent Publication No. 2004/0021982). Although Applicants respectfully traverses this rejection, Claim

Claim 1 is directed to a magnetic recording head for a helical scan type magnetic recording/reproducing apparatus. The magnetic recording head comprises a multi-gap recording head having “n” gaps, formed by laminating “n” recording heads, said “n” being an integer greater than 2, with the “*n*” recording gaps are *wider than a track pitch and overlap each other in a pitched manner* so as to record a pattern of *juxtaposed* tracks, and a gap for recording the last track among “n” gaps of the multi-gap recording head has a wider gap than other gaps.

Thus, the claimed magnetic recording head has “n” recording gaps that are wider than a track pitch and overlap each other in a pitched manner so as to record a pattern of juxtaposed tracks. Moreover, a gap for recording the last track among “n” gaps of the multi-gap recording head has a wider gap than other gaps.

Referring to Applicants’ Figure 2 as an illustrative example, Applicants’ claimed invention comprises a multi-gap recording head 30 configured by laminating recording heads W1 to W4. Recording heads W2 to W4 have a core width CW equal to a track width TP augmented by $\alpha 1$ so as to overlap $\alpha 1$ the tracks formed by the recording heads W1 to W3. The recording head W1 has a core width equal to $TP + \alpha 2$ so as to project by $\alpha 2$ outward of its track pitch TP, with $\alpha 2$ being greater than $\alpha 1$.

By arranging these recording and reproducing head configurations, narrow recording tracks, about 1 to 3 μm , can be recorded on a tape recording medium while substantially minimizing any non-recorded areas, i.e. leaving no space between recorded tracks, and these narrow tracks can be reproduced using so-called non-tracking (NT) technology by scanning a single recorded track twice in one rotation of the head drum.

This is clearly unlike both Nishijima and Ozue which fail to disclose or suggest a magnetic recording head with “n” recording gaps that are wider than a track pitch and overlap each other in a pitched manner so as to record a pattern of juxtaposed tracks, and a gap for recording the last track among “n” gaps of the multi-gap recording head has a wider gap than other gaps.

The Examiner acknowledged Nishijima fails to disclose the recording head as being formed by lamination, but states that Ozue does for the purpose of multi-channeling and for effectively processing narrower tracks by pointing to Paragraphs 9 and 10 for support.

However, Ozue states in Paragraphs [0073] and [0074] that (emphasis added):

“[0074] Further, a distance ω_1 between the two magnetic recording head elements 28 and 28 in a similar magnetic recording head layer 21 is formed to be $\omega_1=3 \mu\text{m}$. As a result, the magnetic recording head element 28 on the left-hand side in the uppermost magnetic recording head layer 21 and the magnetic recording head element 28 on the right-hand side in the bottom magnetic recording head layer 21 are positioned such that they do not overlap in the direction of lamination and that their edge lines on either side nearest to the other are linearly aligned in the direction of lamination (see FIG. 2).

[0075] Accordingly, all of the eight pieces of the magnetic recording head elements 28, 28, . . . , 28 in the magnetic recording head 20 thus constructed are ensured to be positioned without overlapping in the direction of lamination.”

Thus, the references Nishijima and Ozue, singly or in combination with each other, fail to teach or disclose fail to disclose or suggest a magnetic recording head with “n” recording gaps that are wider than a track pitch and overlap each other in a pitched manner so as to record a pattern of juxtaposed tracks, and a gap for recording the last track among “n” gaps of the multi-gap recording head has a wider gap than other gaps.

Accordingly, Claim 1 is allowable over Nishijima in view of Ozue.

Independent Claims 2, 7, and 12 have been amended in a similar fashion as Claim 1,

As such, these claims are also allowable over Nishijima in view of Ozue, as are their corresponding dependent claims for at least the same reasons.

Amended Claims 5, 6, 15 and 16 recite that each of the reproducing heads having a head width which is 1/2 of a track width or less.

The Examiner states that in the Claim 8 rejection that Nishijima teaches the above cited feature of Claims 15 and 16 by requesting to see the audio reproducing head in relation to standard play video reproducing head of FIG. 2.

However, upon examination of FIGs. 2 – 4 Applicants submit that the video reproducing head 3 measures 60 μm and overlaps simultaneously both the audio track 9 and the video track 10. As such, Nishijima fails to teach or disclose that each of the reproducing heads having a head width which is 1/2 of a track width or less. Moreover, Ozue also fails to teach or suggest this feature of Claims 15 and 16.

Thus, Claims 5, 6, 15 and 16 are patentable over Nishijima in view of Ozue

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

II. Conclusion

In view of the above amendments and remarks, Applicants submit that Claims 1 – 16 are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

Dated: 3/26/07

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